

AL.D.2003-268

University of Alberta Library



0 1620 3682081 7

SCIENCE 7

Module

2

Plants for Food and Fibre

**Home Instructor's Guide
and
Assignment Booklet 2B**



Learning
Technologies
Branch

Alberta
LEARNING

Science 7

Module 2: Plants for Food and Fibre

Home Instructor's Guide and Assignment Booklet 2B

Learning Technologies Branch

ISBN 0-7741-2411-3

Cover photo: PhotoDisc Collection/Getty Images

The Learning Technologies Branch acknowledges with appreciation the Alberta Distance Learning Centre and Pembina Hills Regional Division No. 7 for their review of this Home Instructor's Guide and Assignment Booklet.

This document is intended for	
Students	✓
Teachers	✓
Administrators	
Home Instructors	✓
General Public	
Other	

You may find the following Internet sites useful:

- Alberta Learning, <http://www.learning.gov.ab.ca>
- Learning Technologies Branch, <http://www.learning.gov.ab.ca/ltb>
- Learning Resources Centre, <http://www.lrc.learning.gov.ab.ca>

The use of the Internet is optional. Exploring the electronic information superhighway can be educational and entertaining. However, be aware that these computer networks are not censored. Students may unintentionally or purposely find articles on the Internet that may be offensive or inappropriate. As well, the sources of information are not always cited and the content may not be accurate. Therefore, students may wish to confirm facts with a second source.

ALL RIGHTS RESERVED

Copyright © 2003, the Crown in Right of Alberta, as represented by the Minister of Learning, Alberta Learning, 10155 – 102 Street, Edmonton, Alberta T5J 4L5. All rights reserved. Additional copies may be obtained from the Learning Resources Centre.

No part of this courseware may be reproduced in any form, including photocopying (unless otherwise indicated), without the written permission of Alberta Learning.

Every effort has been made both to provide proper acknowledgement of the original source and to comply with copyright law. If cases are identified where this effort has been unsuccessful, please notify Alberta Learning so that appropriate corrective action can be taken.

IT IS STRICTLY PROHIBITED TO COPY ANY PART OF THESE MATERIALS UNDER THE TERMS OF A LICENCE FROM A COLLECTIVE OR A LICENSING BODY.

Section 2: Farming and Forestry

Now that the student has been given a basic understanding of the need for plants as well as their general structures and functions, the technologies of how plants can be grown to maximize their yield are introduced. In the first lesson of this section, the many ways that have been developed to meet the needs for food and fibre are examined. For example, the student has the opportunity to see the results of growing plants in a greenhouse environment. The change over the years of both farming and forestry practices are pointed out as the student is led to the idea of sustainability. An Alberta link is incorporated that introduces the valuable crops grown in Alberta as well as the forestry industry in different areas of the province. The student is constantly reminded of the effects of harvesting these crops and trees on the environment now and in the future.

Lesson 2 starts out by discussing the valuable natural resource used by plants—soil. It examines the different parts of soil and how different soils form in varying areas. A pathway investigation is provided with an exciting opportunity to examine the formation of soil and all its contents virtually. Building on this knowledge, the student is then called upon to examine chemical versus organic fertilizers as well as other challenges that present themselves regarding the sustainability of soil. Solutions to problems, such as erosion and salinization, are presented in a problem-solving approach. The lesson concludes by discussing a technology that has been developed that requires no soil—hydroponics.

The final lesson of this section involves pests and various ways to control them. The idea of when a pest is really a pest is examined in activities as well as the traits of a successful pest. Three main pest types are introduced: other plants, animals or insects, and fungi or bacteria. Different technologies that have been developed to control these pests are then examined. Chemical toxins—herbicides, pesticides, and fungicides—are first discussed. Their harmful effect on the environment and ecosystems is then brought forth. The lesson concludes with alternate ways to control pests in order to create sustainable environments, methods such as organic farming and biological controls. The student is given the chance to problem solve against a pest using organic methods. The final portion of this module discusses the roles of both the producer and consumer in the use of plants for food and fibre. The focus should be continually brought back to sustainability as growing conditions are improved.

Section 2: Lesson 1

- thumbtack (or pushpin)
- potting soil (or garden soil)
- 4 trays (or saucers)
- scissors
- clear adhesive tape
- thermometer
- graduated cylinder
- ruler
- 4 coloured pencils
- 8 paper (or foam) drinking cups
- sprouted seeds
- 4 clear, plastic drinking cups
- water
- foam meat trays (or baking pans)
- organic material (e.g., wood shavings, grass clippings, leaves)
- paper towel

Section 2: Lesson 2

- thumbtack
- scissors
- spoon
- magnifying glass
- ruler
- measuring cup (or graduated cylinder)
- 3 glasses (or 250-mL beakers)
- 3 small jars with screw lids (250–500 mL)
- 6 disposable cups
- labels
- 3 plastic lids (e.g., from a yogurt container)
- water
- sand
- potting soil
- garden soil (or yard soil)
- 3 cone-shaped coffee filters

Section 2: Lesson 3

- large sheets of paper
- felt markers

Special Considerations and Comments

Inquiry Investigation: Growing Under Glass

This investigation requires 4 to 5 days of prelab preparation. The investigation itself takes about 7 days to complete observations. At least 10 seeds should be germinated prior to the lab. (The student can be reminded of how to do this by referring to the germination study in Section 1.) Eight of the sprouted seeds can then be used in the investigation.

Section 2: Lesson 3

Special Considerations and Comments

Find Out Activity: Pesticide Safety Labels

The student needs to examine a pesticide container for this activity. If none are available in the house, a local greenhouse or hardware store will have many containers to choose from. The student needs to regard the safety precautions on the labels and be advised against opening the containers.

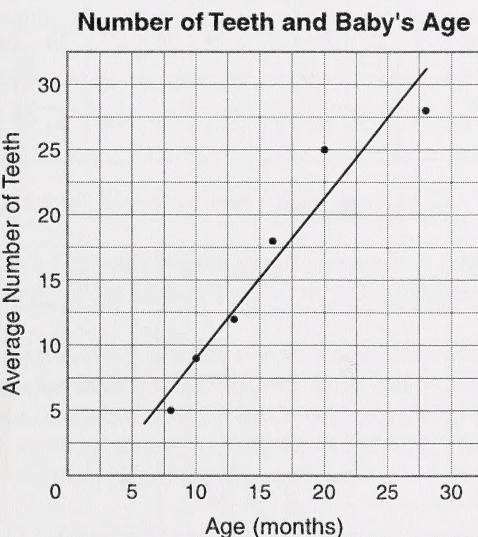
Suggested Answers

Section 2: Lesson 1

6. Textbook question 4 of “Extension,” p. 136

4. Potatoes use about 60 times more land than greenhouse crops. Crops grown in greenhouses involve a lot of special care. The work is very labour intensive and crops cost more to grow. The crops grown in a greenhouse are sold for a lot more money than those grown in a field, such as potatoes. The growing season in a greenhouse can continue year-round, enabling a lot more crops to be grown. Potatoes have a relatively short growing season as they are grown outdoors.

8. Textbook question “Instant Practice,” p. 477



9. a. Answers will vary. A sample answer is given.

How does the temperature of the soil affect a plant’s rate of growth?

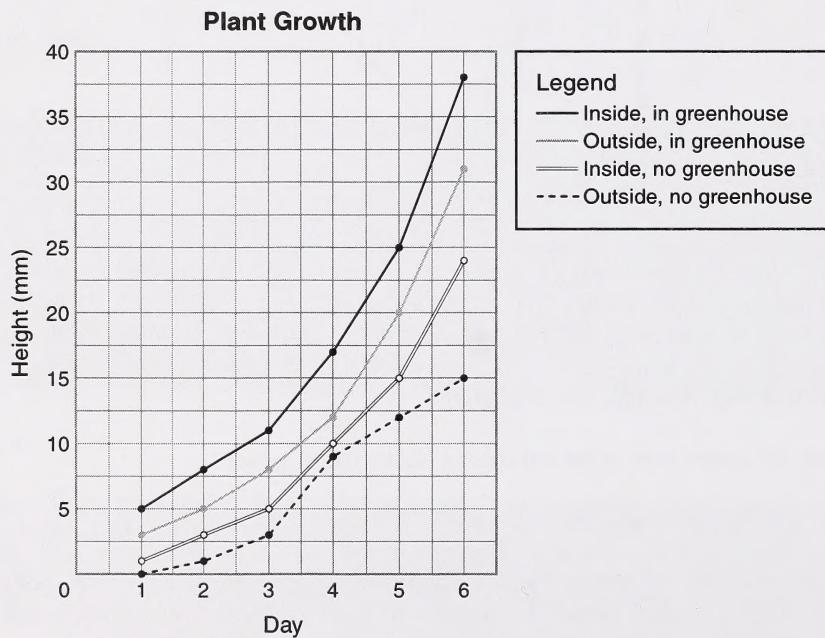
b. Answers will vary. A sample answer is given.

As the temperature of the soil increases, the plant’s rate of growth will increase to a point, after which the growth rate will quickly decrease. Warm temperatures allow the plant to work (photosynthesize and transport materials) efficiently. If, however, the soil gets too hot, the root hairs could become damaged and stop absorbing nutrients and water.

Note: There is a formula for writing a hypothesis given on page 5 of Home Instructor’s Guide 2A.

c. Answers will vary. Sample data is given.

Plant Environment	Air Temperature (°C)						Soil Temperature (°C)						Plant Height (mm)					
	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6
inside, in greenhouse	31	30	32	35	33	32	33	31	33	36	34	33	5	8	11	17	25	38
inside, no greenhouse	22	22	21	22	22	22	23	23	23	24	23	23	3	5	8	12	20	31
outside, in greenhouse	26	28	24	25	27	26	27	29	26	27	29	28	1	3	5	10	15	24
outside, no greenhouse	12	13	14	13	13	12	12	13	15	14	14	13	0	1	3	9	12	15

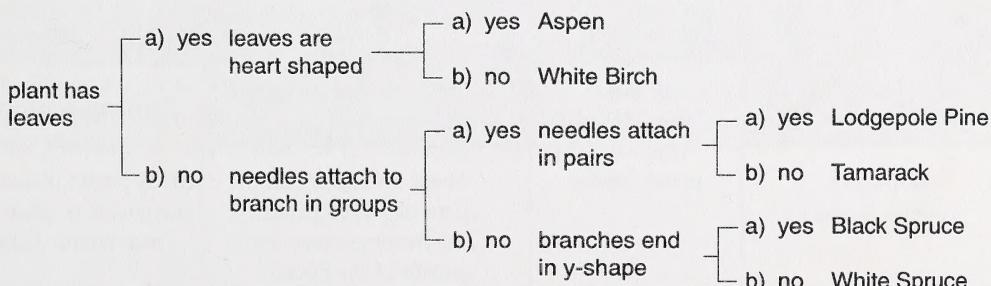


d. Textbook questions 1 to 4 of “Analyze,” p. 139

- Most likely, the plant grown inside and in a greenhouse will grow the most. Depending on the season, temperature outside, and amount of light available, the plant growing inside without a greenhouse and the plant growing outside in a greenhouse will likely grow at about the same rate. The plant that will experience the least growth will probably be the plant outside without a greenhouse.
- A greenhouse improves the air and soil temperatures. Within a greenhouse, these temperatures are higher. **Note:** If a greenhouse has artificial lights, the amount of light (length of exposure and intensity) can be improved as well. Furthermore, within a greenhouse, the amount of water, the type of soil, and amount of fertilizers can be controlled more easily.
- Two seeds were used so you could average your results or in case one of the seeds failed to grow. Three to five seeds would have been even better as long as there was enough room for growth.
- The manipulated variable in this experiment was the environment the plants were grown in (inside or out, with or without a greenhouse). The responding variable was the growth of the plants, measured as their height.

e. Textbook questions 5 and 6 of “Conclude and Apply,” p. 139

- Most likely, your observations did support your hypothesis. It is likely that you already knew that a greenhouse has a positive effect on plants grown in its artificial environment.
- Plants for food and fibre raised in greenhouses are expensive because expenses are high. With plants so close together in such a desirable environment, pests can become a problem. Many plants will not grow in such crowded conditions. Many plants rely on organisms not found in greenhouses for pollination. Usually, the crops grown in greenhouses are those that grow quickly and will give a very high profit, such as tomatoes, peppers, and cucumbers.
- a. Answers will vary. The key should be set up much like the key provided in Module 1. Choices should be based on specific characteristics the student can see or read in the textbook. You should be able to identify each tree by following a sequence of choices and instructions through the key. Help the student clarify his or her key where necessary. A sample key is given.



b. The steps to each tree's name should be listed in a format like the following:

- a), a), Aspen
- a), b), White Birch
- b), a), a), Lodgepole Pine
- b), a), b), Tamarack
- b), b), a), Black Spruce
- b), b), b), White Spruce

Section 2: Lesson 2

5. a. **Textbook questions 1 to 4 of “Analyze,” p. 154**

1. Answers will vary depending on soils chosen. Most likely, potting, garden, or lawn soil will be loam.
2. Answers will vary depending on the soils chosen.
3. Answers will vary. A potting soil is likely to have the most organic matter. Sand or sandy soil would have the least.
4. Water would pour quickly through sand or sandy soil because of the large pores and the lack of water-retaining organic material. Potting soil would probably hold water the best. It has lots of organic material, large pores, as well as added manufactured materials, which are made to absorb water.

b. **Textbook question 6 of “Conclude and Apply,” p. 154**

6. The garden soil or the potting soil would both be good to use in a garden. The soil with an equal amount of organic and mineral particles as well as sufficient spaces is ideal. Too much clay in the soil would not allow enough air into the soil.

Section 2: Lesson 3

4. The table should be neat and legible. Students should have research on at least four more common pests. Answers will vary depending on pests chosen. A sample table follows:

Pest Research			
Source	Pest Identified	Direct and/or Indirect Effect of Pest	Control Methods
neighbour (potato farmer)	potato beetle	Feeds on leaves and stems of potato plants. This feeding stunts the growth of the potato.	Spray potato plants with insecticide or plant peas near potato plants.

5. Textbook question 1 of “What Did You Find Out?,” p. 164

1. Answers will vary. Technologies used to control pests include herbicides, insecticides, fungicides, strip farming (two or more crops planted in alternating bands), biological controls, pest-resistant plant varieties, spacing of plants, hand removal of pests, hoeing and cultivating, and summer fallowing.
11. A *herbicide* is a substance used to control or kill plant pests.

An *insecticide* is a substance used to control or kill insect pests.

A *pesticide* is a substance used to control or kill pests.

Residues are chemicals or the break-down products of chemicals that remain in soil, water, air, or organisms for some period after the chemical has been applied.

12. Pesticide residues and break-down products could build up and remain in the environment for many decades, affecting the health of future generations.
14. **Textbook question “What Did You Find Out?,” p. 171**

Answers will vary depending on the pesticide chosen. You should discuss the questions and labels with the student. The instructions on the label are usually not sufficient to keep all users and the environment safe. Warnings often use complicated wording that may be difficult for some people to understand. Often, long-term consequences are not even mentioned.

Module Summary

Suggested Answers

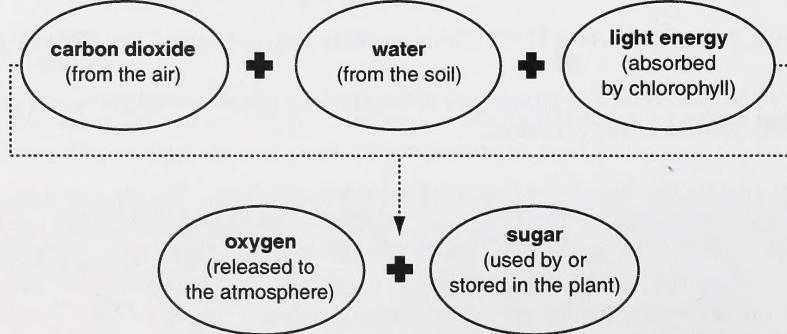
1. Textbook questions 1, 4, 6, 8, 10, 11, 14, and 17 of “Understanding Key Concepts,” pp. 180 and 181

1. Technologies that can be used to modify growing conditions include greenhouses, hydroponic gardens, row covers, fertilizers, pesticides, and irrigation.
4. The water moves into the tea bag through its semi-permeable bag by osmosis. The tea leaves cannot escape through this membrane. The tea flavour diffuses into the water. Then the water carrying the tea flavouring diffuses throughout the water in the cup until the tea is equal in strength throughout the cup. The sugar dissolves and diffuses through the water until it, too, is spread evenly throughout (in equilibrium). Sugar would also diffuse through the selectively-permeable membrane into the tea bag since the pores are big enough for the sugar particles to pass through.

6. Annuals and perennials use different lifecycle strategies. Generally, perennials die in the fall and then regrow from roots or stems in the spring. Annuals die each year. They must be grown from seed each spring.
8. Seed dispersal is the end of a seed plant's lifecycle and the beginning of a new lifecycle. It is important that the seeds be spread out from the parent plants because overcrowding would occur if they all grew close together. Only seeds that land in favourable environments will grow. Spreading seeds widely increases the chances of some of the seeds finding appropriate conditions.
10. Many ways could be listed, such as building canoes for transportation, food, medicines, diapers, and building shelters.
11. Selective breeding occurs when people select organisms with desirable characteristic to breed. Over successive generations (usually) the desired trait becomes more and more common until a new variety is produced. Genetic modification/engineering involves producing a desirable trait by directly changing (adding, removing, or altering) an organism's genes.
14. Seeds are dormant. Seeds contain tiny plants, known as embryos, that germinate only when conditions are right. These tiny plants can remain in seed for years before sprouting and moving into the seedling stage of their lifecycle.
17. Soil erosion can be caused by soil exposure to wind or water. It can be prevented by leaving vegetation on the soil (ground cover), protecting the soil from wind with shelterbelts or row covers, using manure as fertilizer to keep humus levels up, keeping moisture levels up by irrigating or by performing practices like zero-tillage or wide-shovel cultivation.

2. Textbook questions 19 and 23 of "Developing Skills," p. 181

19.

Photosynthesis

23. Plant growth may be monitored by measuring plant height each day, by estimating any increases that take place in leaf surface area, by counting the number of leaves each week, or by measuring the mass of the plant in its pot once a month.

3. Textbook questions 25 and 29 of “Problem Solving/Applying,” p. 182

25. Water stimulates growth and softens the seed coat so that the seedling can break through.

29. a. Lodgepole pines would benefit from dispersing their seeds only under intense heat because the seedlings would grow quickly when no other plants are in competition with them.

b. Taproots allow the dandelion to gather water deep down, and it is very difficult for the entire root to be pulled out when trying to pull out the dandelion. The dandelion can then reproduce asexually from those roots.

c. Horizontal runners allow strawberry plants to reproduce asexually from their stems and spread over a large area. The adult supports the new plant with food and water until it can survive on its own.

d. The barrel cactus stores water in its stem. The leaves have been modified into spines to limit evaporation of the water. The spines also act as a protection mechanism against animals that may try to get to the water stored in the cactus.

e. Seeds that can wait for years before sprouting are beneficial because they can wait to sprout until conditions are right and survival chances are maximized. The harsh northern climate makes this an important adaptation.

f. A light and feathery seed ensures good dispersal of seeds by even the lightest wind.

4. Textbook questions 30, 34, 35, and 38 of “Critical Thinking,” pp. 182 and 183

30. Plants return water to the air, produce oxygen, remove carbon dioxide and a variety of toxins from the environments, and turn light energy into food. The rain forests also have many plants that have not yet been identified or researched. They may yet prove to be a source of medicines.

34. Experiments needed to be started with seeds that have already sprouted because there is not a 100% rate of germination of all seeds. If the growing conditions were being studied, for example, the samples would all have to start as a seedling that is already growing so results can be compared fairly.

35. Sustainability is so important because future generations will require plants for food and fibre just as much as people do now. If care is not taken in the way plants are grown and harvested now, the land will not be able support the growth of the plants in the future.

38. a. Soil could be tested for organic matter by squeezing it. Humus holds soil together, yet prevents it from hardening into a solid clump that is hard to break. A water drainage test could be conducted. Generally, the more water the soil holds, the more organic matter present.

b. Organic matter is so important because it adds crucial nutrients to the soil, improves its structure (texture, looseness), retains moisture, and holds it together (making it less likely to be blown away).

c. Organic matter can be increased in the soil by adding leaves, compost, or animal waste (manure). Ground cover could be left on the soil between growing seasons. Organisms that recycle nutrients, such as earthworms and bacteria, could also be added to the soil.

ASSIGNMENT BOOKLET 2B

Science 7

Module 2: Section 2 Assignment and Final Module Assignment

Home Instructor's and Student's Comments:

STUDENT FILE NUMBER (if label is missing or incorrect) _____ Date Submitted: _____	Apply Module Label Here <table border="1"><tr><td>Name</td><td>Address</td><td></td><td></td></tr><tr><td></td><td></td><td></td><td>Postal Code</td></tr></table>	Name	Address						Postal Code	<p>Please verify that preprinted label is for correct course and module.</p> FOR SCHOOL USE ONLY Assigned Teacher: _____ Date Assignment Received: _____ Grading: _____
Name	Address									
			Postal Code							

Teacher's Comments

Teacher's Signature

Home Instructor: Keep this sheet when it is returned to you as a record of the student's progress.

INSTRUCTIONS FOR SENDING IN THIS DISTANCE LEARNING ASSIGNMENT BOOKLET

When you register for distance learning courses, you are expected to send in Assignment Booklets for corrections regularly. Try to send each Assignment Booklet as soon as you have completed it. Before sending your Assignment Booklet, please check the following:

- Are all the assignments completed? If not, explain why.
- Has your work been reread to be sure the spelling and details are correct?
- Is the record form filled out and the correct module label attached?

MAILING

1. Postage Regulations

Do **not** enclose letters with Assignment Booklets.

Send all letters in a separate envelope.

2. Postage Rates

Take your Assignment Booklet to the post office and have it weighed. Attach enough postage and seal the envelope. Assignment Booklets will travel faster if correct postage is used and if they are in large envelopes that are no more than two centimetres thick.

FAXING

1. Assignment Booklets may be faxed. Contact your teacher for the fax number.
2. All faxing costs are the responsibility of the sender.

E-MAILING

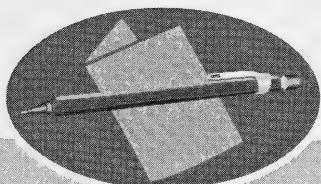
Assignment Booklets may be e-mailed. Contact your teacher for the e-mail address.

Science 7

Module 2

Plants for Food and Fibre

ASSIGNMENT BOOKLET 2B



**Learning
Technologies
Branch**

Alberta
LEARNING

FOR TEACHER'S USE ONLY

Summary

	Total Possible Marks	Your Mark
Section 2 Assignment	44	
Final Module Assignment	46	
	90	

Teacher's Comments

Science 7
Module 2: Plants for Food and Fibre
Assignment Booklet 2B
Learning Technologies Branch

The Learning Technologies Branch acknowledges with appreciation the Alberta Distance Learning Centre and Pembina Hills Regional Division No. 7 for their review of this Home Instructor's Guide and Assignment Booklet.

This document is intended for		You may find the following Internet sites useful:
Students	✓	 <ul style="list-style-type: none">Alberta Learning, http://www.learning.gov.ab.caLearning Technologies Branch, http://www.learning.gov.ab.ca/ltbLearning Resources Centre, http://www.lrc.learning.gov.ab.ca
Teachers	✓	
Administrators		
Home Instructors		
General Public		
Other		

Copyright © 2003, the Crown in Right of Alberta, as represented by the Minister of Learning, Alberta Learning, 10155 – 102 Street, Edmonton, Alberta T5J 4L5. Print copies may be obtained from the Learning Resources Centre. Digital copies are available to registered Alberta educators at the Tools4Teachers website: <http://www.tools4teachers.ab.ca>

Every effort has been made both to provide proper acknowledgement of the original source and to comply with copyright law. If cases are identified where this effort has been unsuccessful, please notify Alberta Learning so that appropriate corrective action can be taken.

ASSIGNMENT BOOKLET 2B

SCIENCE 7: MODULE 2

SECTION 2 ASSIGNMENT AND FINAL MODULE ASSIGNMENT

Your mark for this module will be determined in part by how well you do your assignments.

This Assignment Booklet is worth 90 marks out of the total 145 marks for the assignments in Module 2. The value of each assignment and each question is stated in the left margin.

Work slowly and carefully. If you have difficulty, go back and review the appropriate topic.

Be sure to proofread your answers carefully.

44

Section 2 Assignment: Farming and Forestry

Read all parts of your assignment carefully and record your answers in the appropriate places.

For questions 1 and 2, read each question carefully. Decide which of the choices BEST completes the statement. Place your answer in the blank space given.

1

_____ 1. The amount of natural forest in Alberta has changed over the years. Compared to 1905, the amount of natural forest in Alberta is now

- A. less
- B. more
- C. the same

1

_____ 2. The yield of a farmer's crop on irrigated land has decreased over the years. This is most likely due to

- A. poor choice of crops
- B. soil salinization
- C. too little water
- D. too much water

3. There are four pests shown in Figure 2.70 on page 168 of the textbook. (They are ant, caterpillar, gopher, and dandelion.)

a. Create a classification key to identify the four pests.

(6)

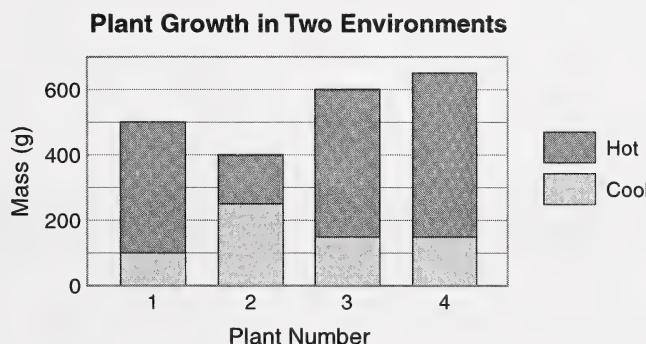
b. List the series of steps used to identify each of the organisms.

(4)

4. Farmers need to make a living producing plant products. Earth needs a sustainable environment. Name and briefly explain four ways farmers can grow enough plant products, yet maintain a sustainable environment.

③ 5. Controlled environments can often help increase the yield and quality of crops. Think about factors that can be controlled in a greenhouse. List six factors that could lead to successful plant growth.

① 6. Four different plant species were raised for a month in a cool environment. Their masses were recorded. Then they were placed into a hot environment. A month later, the masses were again recorded. The results are shown in the following graph.



Which plant species would most likely grow best in a cool environment?

Return to page 64 of the Student Module Booklet and begin Lesson 2.

For questions 7 and 8, read each question carefully. Decide which of the choices BEST completes the statement or answers the question. Place your answer in the blank space given.

① _____ 7. A hydroponically grown plant has its roots in

- A. mature soil
- B. water
- C. clay
- D. rope coils

(1)

_____ 8. Which activity is most likely to enhance the soil?

- A. irrigation
- B. fertilizing with cattle manure
- C. fertilizing with chemical fertilizer
- D. summer fallowing

9. Organic or chemical fertilizers can be used on farms.

(2)

b. List two specific problems that could arise because of your choice.

(3)

10. Foresters want replanted forests to grow quickly and well. List three practices they can use to improve growing conditions. Be specific.

(2)

11. How do crops and reforested areas compare to a natural ecosystem?

12. Florencia is taking her dog for a walk. She's in the hilly meadows just beyond her grandparents' farm. She sees a white crust on the soil around the edges of the sloughs.

(1)

a. What condition is the crust evidence of?

(2)

b. Give two factors that can lead to this condition.

Return to page 76 of the Student Module Booklet and begin Lesson 3.

For questions 13 to 15, read each question carefully. Decide which of the choices BEST completes the statement or answers the question. Place your answer in the blank space given.

(1)

_____ 13. Malaria is a disease spread by insects. It kills more than 1 million people every year. The first synthetic treatments for the disease are

- A. no longer effective
- B. still the best
- C. too expensive
- D. not safe

(1)

_____ 14. In rural Alberta you can often go for miles and see only one crop growing. A plant fungus strikes. In this situation you would expect

- A. the fungus will have little effect
- B. only the one farmer will be affected
- C. some farmers in the area will be affected
- D. most farmers in the area will be affected

① _____ 15. A beekeeper's apiary is between a cherry orchard and a field of clover. The orchardist had to spray for insect pests that were attacking the maturing cherries. Great care was taken to prevent the spray from blowing out of the orchard. What effect will this have on the bee keeper?

A. Honey production will increase.
B. Honey production will decrease.
C. Honey production will be unaffected.
D. The hives will be devastated.

16. The mycorrhizae fungus helps plants. It helps the roots absorb water and nutrients from the soil. It receives sugar (food) from the plant in return.

a. Classify the fungus's relationship with plants.

② b. Acid rain and soil pollutants often kill mycorrhizae fungus. Predict the effect this would have on the plants they associate with. Explain your prediction.

③ 17. Name the three main types of pests that affect plants. Provide one specific negative effect that each type can have on a plant grown for food or fibre.

 Return to page 86 of the Student Module Booklet and begin the Section 2 Review.

46

Final Module Assignment

Read all parts of your assignment carefully and record your answers in the appropriate places.

1. Read the following story. Then answer the questions that follow.

“Zachary, would you mind running in while I stay in the car? I’m going to keep it running to keep your little sister warm. Here is the list of the few things I need you to pick up. Here, don’t forget to use our reusable cotton bags. Please hurry, Zach, I don’t have much gas left!”

“Sure, Mom, no problem.”

Zachary grabbed a grocery cart and pulled the paper list out of his jeans pocket as he headed into the store. Starting in the produce section, he snatched a bunch of bananas and half a seedless watermelon. He couldn’t resist the juicy oranges on the next wooden fruit stand. He then raced around to the next aisle, grabbing a garlic bulb on his way. Cereals were in this aisle, so he chose the wheat squares covered with a sugary frosting. Margarine was another item on the list, and he knew where to find that. His mother had also put some non-food items on the list. Towards the pharmacy section, he grabbed some toilet paper, diapers, aloe vera lotion, and echinacea tablets for his dad. He now had everything on the list. His mom would be proud of how fast he shopped. Hopefully, she hasn’t run out of gas out there!

a. Name four plants or plant products that will be used for food by Zachary’s family.

b. Name two plants or plant products that would not be used for food or fibre.

(2)

c. Seedless watermelons are not found in nature. How are the seedless watermelons produced?

2. You are an apple grower. There was a nasty spring windstorm. It removed most of the petals from the apple blossoms throughout your orchard.

(2)

a. Predict what this year's harvest will be like. Explain your reasoning.

(2)

b. Could this windstorm affect organisms other than your apple trees? Explain your reasoning.

(4)

3. Explain what is meant by sustainability using the following words in your response:

- consumers
- technology
- environment
- monitor
- long-term
- producers
- soil
- responsible

(6)

4. You have a seedling you wish to grow. You want to provide it with the best things life can offer. You are going to start by carefully selecting soil to grow it in. List the major components that you would look for in a good soil. Explain the importance of each component to your plant's health.

5. Imagine you have discovered a pest in your garden. You decide to investigate. You hope to find a way to control it. You find out the pest feeds on the raspberries and the sweet flowers of the pea plants. It tends to feed in the morning and hides away during the hot temperatures of the afternoon. It lives on the surface of the soil. It hides under the larger-leaved plants for shade, moisture, and protection. It does not venture out into the lawn. You notice that the pest is most visible during or shortly after a rain. It appears to love the water. You ask your neighbours if they have problems with this pest. They note that they did until they put a bumbley-bug house in their garden. (They also bought some bumbley bugs to live in it.) Suddenly their problem disappeared.

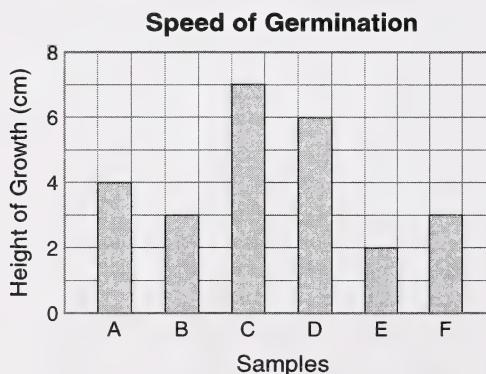
(4)

a. Describe four different organic things you could do to control this pest. You want to remove its negative influences on your garden.

(1)

b. Name the control method the bumbley bug plays in your neighbours' garden.

6. Use the following graph to answer the questions that follow.



(1)

a. What stage in the plant's lifecycle is being studied in this investigation?

(2) b. Early in their growth, would these young plants be classified as producers or consumers? Explain.

(2) c. The plants in sample D are very unhealthy. Explain how you would judge their health.

(2) 7. The process of photosynthesis is essential to almost all life forms. Give two reasons explaining why.

(6) 8. There are three pairs of terms in the first column of the table. You are to explain how they are similar. Record these in the second column. You are also to explain how they differ. Record the differences in the third column.

Terms	Things in Common	Differences
pistil and stamen		
flower and cone		
anther and stigma		

② 9. Adaptations usually benefit the species. A plant has an adaptation that prevents self-pollination. What is the benefit of cross-pollination to the species?

② 10. Dandelions are a very hardy pest. You are searching for a biological control for them. What factors should be considered? What are some characteristics of a good biological control for dandelions?

② 11. A plant has plain, scentless flowers. They are about the same colour as the plant's leaves. What is the most likely method of pollination for this plant? Explain your reasoning.

For questions 12 to 14, read each question carefully. Decide which of the choices **BEST** completes the statement or answers the question. Place your answer in the blank space given.

① 12. A corn farmer's crops are being devoured by an insect pest. Which of these choices would be in the farmer's best interest?

- A. using a cheap pesticide that would kill all insects including bees
- B. using an expensive pesticide that would kill all insects except bees
- C. importing an expensive exotic mite that would kill the pest
- D. ploughing the crop under to starve the insect pest

(1)

_____ 13. A group of lake-front cottage owners noticed a problem with their lake. It was becoming overgrown with algae. Run-off from the surrounding farms supplied most of the water for the lake. Which is the most likely cause of the cottage owners' problem?

A. their use of laundry detergent
B. over-fishing on the lake
C. farmers' misuse of fertilizer
D. cool, wet weather

_____ 14. Some consumers choose to buy organic products. Others do not. One possible reason for **rejecting** organically grown produce is

A. damage to the environment
B. inferior flavour
C. less perfect-looking
D. poor nutritional value



Submit your completed Assignment Booklet 2B to your teacher for assessment.

ASSIGNMENT BOOKLET DECLARATIONS

The Student's Declaration is to be signed by a student registered at the Alberta Distance Learning Centre. If the student is under 16, the Supervisor's Declaration is to be signed by the student's supervisor, who is usually a home instructor, teacher, or home-schooling coordinator. Failure to complete this page may invalidate the assignment results.

STUDENT'S DECLARATION

- I have followed the instructions outlined in the Student Module Booklet.
- I have completed the activities to prepare myself for the assignments in this Assignment Booklet.
- I completed the assignments in this Assignment Booklet by myself.

Student's Signature

SUPERVISOR'S DECLARATION

I hereby certify that I have supervised the learning activities completed by _____.

Student's Name

I also certify that to the best of my knowledge the assignments in this Assignment Booklet were completed independently by this student.

Supervisor's Signature

If you, the student or supervisor, have any comments or observations regarding this module, write them in the following space.
